

Dynamic Modalities for Social Networks

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Abstract. This tutorial is designed for researchers and students interested in the use of logic applied to the formal analysis of social networks. We look in particular at networks consisting of interconnected agents capable of reflection, communication, reasoning etc. In this context we study the processes of belief formation and belief diffusion (doxastic influence) in social networks. We focus on social phenomena such as ‘informational cascades’ and apply our logic to analyze whether rational agents who use their higher-order reasoning powers can ultimately stop a cascade from happening. Within the context of studying social influence dynamics, we further highlight how results from network theory about the characterization of informational cascades follow immediately from our logical axioms. In the last part of the tutorial we focus on the dynamic process of social group creation or ‘friendship selection’, modelling the changes in the network-structure of agents. This leads to a new setting in which we can model both the dynamic process of social influence and the dynamics of friendship selection as well as their interplay, which is of interest for the study of ‘homophily’ in the social sciences. This tutorial will refer to a number of recent papers on these topics and uses a variety of formal tools coming mainly from dynamic epistemic logic and network theory.